

What is claimed is:

1. A coated substrate comprising:  
an antireflective composition layer comprising a basic material and a crosslinker;  
and  
a photoresist layer over the antireflective composition layer.
2. The substrate of claim 1 wherein the basic material has a pKa of about 3 or greater.
3. The substrate of claim 1 wherein the basic material has a pKa of about 6 or greater.
4. The substrate of claim 1 wherein the basic material has a pKa of about 9 or greater.
5. The substrate of any one of claims 1 through 4 wherein the basic material contains one or more N, O or S atoms.
6. The substrate of any one of claims 1 through 5 wherein the basic material contains one or more amine groups.
7. The substrate of any one of claims 1 through 6 wherein the basic material contains one or more hydroxy, ether, or sulfide groups.
8. The substrate of any one of claims 1 through 7 wherein the basic material has a molecular weight of less than about 500.
9. The substrate of any one of claims 1 through 7 wherein the basic material is a polymeric material.

10. The substrate of any one of claims 1 through 9 wherein the antireflective composition is crosslinked.

11. The substrate of any one of claims 1 through 10 wherein the antireflective composition comprises an acid or acid generator compound.

12. The substrate of any one of claims 1 through 11 wherein the antireflective composition comprises a thermal acid generator compound and a photoacid generator compound.

13. The substrate of any one of claims 1 through 12 wherein the antireflective layer comprises a resin distinct from the basic material.

14. The substrate of any one of claims 1 through 13 wherein the antireflective layer comprises aromatic groups.

15. The substrate of any one of claims 1 through 13 wherein the antireflective layer comprises anthracenyl, naphthylene or phenyl groups.

16. The substrate of any one of claims 1 through 15 wherein the photoresist layer is a positive chemically-amplified photoresist.

17. The substrate of claim 16 wherein the photoresist comprises a resin that contains acetal groups.

18. A method for forming a photoresist relief image, comprising:  
applying an antireflective composition on a substrate, the antireflective composition comprising a basic material and a crosslinker;  
applying a photoresist layer over the antireflective composition layer; and  
exposing and developing the photoresist layer to provide a resist relief image.

19. The method of claim 18 wherein the antireflective layer is crosslinked prior to application of the photoresist layer.

20. The method of claim 18 wherein the antireflective layer is thermally cured prior to application of the photoresist layer.

21. The method of any one of claims 18 through 20 wherein the basic material has a pKa of about 3 or greater.

22. The method of any one of claims 18 through 20 wherein the basic material has a pKa of about 6 or greater.

23. The method of any one of claims 18 through 20 wherein the basic material has a pKa of about 9 or greater.

24. The method of any one of claims 18 through 23 wherein the basic material contains one or more N, O or S atoms.

25. The method of any one of claims 18 through 24 wherein the basic material contains one or more amine groups.

26. The method of any one of claims 18 through 24 wherein the basic material contains one or more hydroxy, ether, or sulfide groups.

27. The method of any one of claims 18 through 25 wherein the basic material has a molecular weight of less than about 500.

28. The method of any one of claims 18 through 25 wherein the basic material is a polymeric material.

29. The method of any one of claims 18 through 28 wherein the antireflective composition comprises an acid or acid generator compound.

30. The method of any one of claims 18 through 29 wherein the antireflective composition comprises a thermal acid generator compound and a photoacid generator compound.

31. The method of any one of claims 18 through 30 wherein the antireflective layer comprises a resin distinct from the basic material.

32. The method of any one of claims 18 through 31 wherein the antireflective composition comprises one or more aromatic groups.

33. The method of any one of claims 18 through 32 wherein the photoresist layer is exposed with patterned radiation having a wavelength of about 260 nm or less.

34. The method of any one of claims 18 through 32 wherein the photoresist layer is exposed with patterned radiation having a wavelength of about 248 nm, 193 nm or 157 nm.

35. The method of any one of claims 18 through 32 wherein the photoresist layer is exposed with radiation having a wavelength of about 248 nm and the antireflective layer comprises anthracenyl or naphthylene groups.

36. The method of any one of claims 18 through 32 wherein the photoresist layer is exposed with radiation having a wavelength of about 193 nm and the antireflective layer comprises phenyl groups.

37. The method of any one of claims 18 through 36 wherein the photoresist layer is a positive chemically-amplified photoresist.

38. The method of any one of claims 18 through 37 wherein the photoresist comprises a resin that contains acetal groups.

39. An antireflective composition for use with an overcoated photoresist composition layer, the antireflective composition comprising a basic material and a crosslinker component.

40. The antireflective composition of claim 39 further comprising a resin distinct from the basic material.

41. The antireflective composition of claim 39 or 40 further comprising an acid or acid generator compound.

42. The antireflective composition of claim 41 wherein the acid generator compound is a thermal acid generator compound.

43. The antireflective composition of any one of claims 39 through 42 wherein the antireflective composition comprises one or more aromatic moieties.

44. The antireflective composition of any one of claims 39 through 42 wherein the antireflective composition comprises one or more phenyl, naphthylene or anthracenyl moieties.